

Combination Sum – III [\(View\)](#)

Find all valid combinations of k numbers that sum up to n such that the following conditions are true:

- Only numbers 1 through 9 are used.
- Each number is used **at most once**.

Return *a list of all possible valid combinations*. The list must not contain the same combination twice, and the combinations may be returned in any order.

Example 1:

Input: $k = 3, n = 7$

Output: `[[1,2,4]]`

Explanation:

$$1 + 2 + 4 = 7$$

There are no other valid combinations.

Example 2:

Input: $k = 3, n = 9$

Output: `[[1,2,6],[1,3,5],[2,3,4]]`

Explanation:

$$1 + 2 + 6 = 9$$

$$1 + 3 + 5 = 9$$

$$2 + 3 + 4 = 9$$

There are no other valid combinations.

Example 3:

Input: $k = 4, n = 1$

Output: `[]`

Explanation: There are no valid combinations.

Using 4 different numbers in the range $[1,9]$, the smallest sum we can get is $1+2+3+4 = 10$ and since $10 > 1$, there are no valid combination.

Constraints:

- $2 \leq k \leq 9$
- $1 \leq n \leq 60$